

## Revision of the *Brachodes pumila* (Ochsenheimer, 1808) species-group (Sesioidea: Brachodidae)

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**Summary.** Within the genus *Brachodes*, the *B. pumila* (Ochsenheimer, 1808) species-group is characterised by the antenna of the males (each segment with a single tooth-like process) and the yellow-orange or white markings of the wings of the females. *Brachodes pumila* (Ochsenheimer, 1808) and *B. candefactus* (Lederer, 1858) are redescribed in detail; *B. diacona* (Lederer, 1858) **syn. n.** is synonymized with the latter species. Two new species, *Brachodes buxeus* **sp. n.** and *B. anatolicus* **sp. n.**, are described from Turkey. The species are compared with *Brachodes appendiculatus* (Esper, 1783), *B. compar* (Staudinger, 1879) **stat. rev.**, and *B. tristis* (Staudinger, 1879).

**Zusammenfassung.** Innerhalb der Gattung *Brachodes* wird die *Brachodes pumila* (Ochsenheimer, 1808) Artengruppe definiert und charakterisiert. Sie läßt sich durch die einfach gesägten Fühler der Männchen und die orange-gelbe oder weiße Flügelzeichnung der Weibchen abgrenzen. *Brachodes pumila* (Ochsenheimer, 1808) und *B. candefactus* (Lederer, 1858) werden detailliert beschrieben. *B. diacona* (Lederer, 1858) **syn. n.** wird mit letzterer synonymisiert. Außerdem werden zwei neue Arten, *Brachodes buxeus* **sp. n.** und *B. anatolicus* **sp. n.**, aus der Türkei beschrieben. Die Arten werden mit *Brachodes appendiculatus* (Esper, 1783), *B. compar* (Staudinger, 1879) **stat. rev.** und *B. tristis* (Staudinger, 1879) verglichen.

**Résumé.** A l'intérieur du genre *Brachodes*, le groupe-espèce de *B. pumila* (Ochsenheimer, 1808) est caractérisé par les antennes des mâles (chaque segment ayant une seule excroissance en forme de dent), ainsi que les taches jaune-orange ou blanches des ailes des femelles. *Brachodes pumila* (Ochsenheimer, 1808) et *B. candefactus* (Lederer, 1858) sont redécrits en détail, *B. diacona* (Lederer, 1858) **syn. n.** étant placé comme synonyme de la dernière. Deux nouvelles espèces, *Brachodes buxeus* **sp. n.** et *B. anatolicus* **sp. n.**, sont décrites de Turkey. Les espèces sont comparées à *Brachodes appendiculatus* (Esper, 1783), *B. compar* (Staudinger, 1879) **stat. rev.** et *B. tristis* (Staudinger, 1879).

**Key words.** *Brachodes pumila* species-group, revision, *candefactus*, *diacona* **syn. n.**, *anatolicus* **sp. n.**, *buxeus* **sp. n.**, *compar* **stat. rev.**

## Introduction

Until the publication of the classification of the superfamily Sesioidea by Heppner & Duckworth (1981) the Brachodidae remained unrecognized by most entomologists. This resulted in only insufficient knowledge even of the western Palaearctic fauna of the family. Investigation of the types of most of the Palaearctic species of *Brachodes* Guenée, 1845 has shown that there is a need to revise a number of taxa to stabilise the taxonomy of the genus. A first contribution to the knowledge of the genus *Brachodes*, a revision of the *B. fallax* (Staudinger, 1900) species-group, was published recently (Kallies 1998). The present work is the second contribution to ongoing studies on Palaearctic Brachodidae.

In 1859, Lederer described two species of *Atychia* Latreille, 1809 from Syria, *Atychia candefacta* from a single female and *Atychia diacona* from a single male, both taken near Damascus. Later, both taxa have been transferred to *Brachodes*, replacing the name

*Atychia* due to its preoccupation within Zygaenidae (Heppner 1981). Examination of material in the Lederer and Staudinger collections and a number of other collections has shown that the two taxa are conspecific: *Brachodes diacona* has to be considered a junior subjective synonym of *Brachodes candefactus*. In the course of study of *Brachodes* species, two other undescribed species from Turkey were found which are closely related to *B. candefactus*. They are described below as *Brachodes buxeus* **sp. n.** and *Brachodes anatolicus* **sp. n.** All three species were found to be similar to *Brachodes pumila* (Ochsenheimer, 1808) in basic morphological characters and are therefore placed in a species group.

Material mentioned in this work is deposited in the following collections: The Natural History Museum, London, England (BMNH); Museum für Naturkunde, Zentralinstitut der Humboldt-Universität, Berlin, Germany (MNHG); Naturhistorisches Museum Wien, Austria (NHMW); Zoologische Staatssammlung München, Germany (ZSM); Naturhistoriska Riksmuseet Stockholm, Sweden (NRMS); Museul di Istorie Naturala "Grigore Antipa", Bucharest, Romania (MGAB); Museum National d'Histoire Naturelle, Paris, France (MNHP); Collection of Axel Kallies, Berlin, Germany (CAK); Collection of Karel Špatenka, Prague, Czech Republic (CKS).

### The *Brachodes pumila* species-group

Description. – Small to medium-sized *Brachodes* moths (alar expanse 14–26 mm) with forewing densely covered with pale yellow to reddish brown scales; with or without yellowish streak along cubitus. Hindwing blackish brown, subbasally whitish to yellowish or at least pale. Antennal segments prismatic, scaled dorsally, each segment with a single tooth-like processus (Figs. 14–18). Proboscis developed or absent. Labial palpus straight, rough-scaled, with or without long tufted scales basally. Female with orange or white forewing pattern. Female genitalia with ductus bursae in basal portion sclerotized asymmetrically and corpus bursae with two fields of small tooth-like, weakly sclerotized signa (cf. Fig. 21 and Zagulajev 1979: Fig. 3).

Diagnosis. – Members of the *Brachodes pumila* species-group are mainly characterised by the shape of the male antennal segments and by the bicoloration of the wings in the females. In certain characters they are similar to species of the *B. appendiculatus* (Esper, 1783) group. In males the latter can be distinguished easily by the antenna (each segment with two spoon-like processes, Figs. 11–13), in females by the completely black wings and the genitalia (without signa of the corpus bursae). The bicoloration of the females is also seen in *Brachodes funebris* (Feisthamel, 1833) and some related species as well as in some species of the *Brachodes fallax* (Staudinger, 1900) group (sensu Kallies 1998). However, all these species can be distinguished from the species treated here by the simple filiform structure of the antenna in male.

Structure. – According to the given description the following species are included in this group: *B. pumila* (Ochsenheimer, 1808), *B. candefactus* (Lederer, 1858), *Brachodes buxeus* **sp. n.**, *B. anatolicus* **sp. n.**, and *B. arenosa* (Zagulajev, 1979). However, the latter species is known to the author only from the description and was not examined.

Although a close relationship between the members of the *B. pumila* species-group is likely, the group characteristics given above are diagnostic only and do not necessarily indicate a monophyletic group.

***Brachodes pumila* (Ochsenheimer, 1808)**

(Figs. 1, 2, 14, 21)

*Atychia pumila* Ochsenheimer, 1808: 3. Type locality: Hungary. Type material not traced, probably in NHMW.

*Noctua chimaera* Hübner, [1808]: pl. 86, Fig. 405 (not *Sphinx chimaera* Hübner, [1796]). Type locality: unknown. Type material destroyed.

References. – Hübner [1822]: pl. 147, Figs. 678, 679 (*Noctua*); Spuler 1910: 301 (*Atychia*); Caradja 1920: 163 (*Atychia*); Buszko & Sliwinski 1978: 18–24, Figs. 2, 9, 10, 13, 14, 17, 18, 20 (*Atychia*); Leraut 1980: 87 (*Brachodes*); Razowski 1981: Figs. 14–17, 26 (*Atychia*); Heppner 1981: 13 (*Brachodes*); Povolny & Kralicek 1985: 94–102, Figs. 3–5, 7–11 (*Brachodes*).

Material examined. – Numerous specimens from Austria, Hungary, Dalmatia, Croatia, Macedonia and South Russia. From other parts of the distribution range only few specimens have been checked. Italy: 2 ♀, Valle d'Aosta, Ozein, 1300 m, 19. VII. 1993, leg. et coll. Bertaccini; ♂, Valle d'Aosta, Pondel, 800 m, 22. VII. 1993, leg. et coll. Bertaccini; Macedonia: ♀, Petrina planina, 1600 m, 24. VII. 1954, leg. Thurner (ZSM); Greece: 2 ♂, ♀, Chelmos Mts, 1600 m, 14. VII. 1995, leg. Lingenhöle (CAK); ♂, Ioannina, Vradeto, 2100 m, 29. VII. 1995, leg. Petersen (CAK); Turkey: ♂, Hadjin [Saimbeyli], [18]88 (MNHB); ♂, Kasikoparan, Korb 1901 (MNHB); ♂, Marasch [Prov. Maraş, Kahramanmaraş], [18]84 Man. (MNHB); ♂, Prov. Kars, 4–18 km SE Karakurt, Aras Valley, 1450–1850 m, 12.–14. VII. 1989, leg. v. Oorschot, de Prins, Coenen & Koolbergen (CWP); Syria: ♀ ♀, ♂ ♂, Shar Devesy (BMNH); Kazakhstan: ♀, Saisan [Zaisan] (MNHB); ♂, Kustanajskaja oblast 94, Amankaragaiski lezchos, 7. VII. 1973, leg. Aibasov (coll. Zolotuhin); ♀, Karag[anda]. oblast, Trostnik, 17. VIII. 1958, leg. Sanova (coll. Zolotuhin); China: 2 ♀, Kuldscha [Yining], Thian occ., coll. Caradja (NHMW, MGAB).

Description. – Male (Fig. 1). Alar expanse 18–22 mm (exceptionally 15–18 mm); forewing length 7–10 mm; body length 7–10 mm. Head: antenna black, scape white, processes of antennal segments apically somewhat bilobed (Fig. 14); labial palpus white, apical joint grey, rough-scaled, without tufted hair-like scales basally (Buszko & Sliwinski 1978: Fig. 2); frons shining leaden grey, ventrally and laterally white; vertex a mixture of white and black scales, with grey tile-like scales centrally; pericephalic scales white; proboscis long, well-developed. Thorax: black, with two short submedial lines in anterior part; tegulae with whitish yellow exterior margins; patagia white laterally, sometimes with a white posterior margin; a small white spot at base of forewing; ventrally mixed with grey and white scales; metathorax with white hair-like scales submedially. Forewing ground color blackish but densely covered with olive-yellow scales; with a white medial streak along fold extending to about one-half of wing; a small white spot close to costa at about two-thirds; all markings densely covered with olive-yellow scales; ventral side black with markings similar to upper side, an additional white patch near anal margin. Hindwing black; a white transverse band subbasally, not reaching anal and costal margins, sometimes divided by a black streak along vein CuA<sub>2</sub>; ventral side similar, but the white transverse band reaching the anal margin; additionally a white streak along costal margin extending into a small white spot near apex. Abdomen with black tergites, each with a narrow white posterior margin; sternites



Figs. 1–2. *Brachodes pumila* (Ochsenheimer, 1808), Greece, Chelmos. 1 – ♂ (CAK). 2 – ♀ (CAK).

white with scattered individual black scales; anal tuft yellowish apically. Male genitalia. – Uncus with two apical tips; valva relatively narrow; aedeagus thick, straight, of moderate length, with numerous weak cornuti.

Female (Fig. 2). – Alar expanse 16–21 mm; forewing length 7–9.5 mm, body length 10–13 mm. Head and thorax similar to male but antenna filiform, densely scaled dorsally; all dark parts black. Abdomen black; tergites 1 and 5 with some white scales at posterior margin; tergites 2 and 6 with well defined narrow white posterior margin; sternites similar but with scattered white scales; 7th segment prolonged, ovipositor about as long as complete abdomen. Forewing black, with a white transverse band at about 1/3 and two white spots at 2/3, ventrally similar to male. Hindwing as in male. Female genitalia (prep. AK140, Fig. 21) with basal portion of ductus bursae sclerotized asymmetrically; corpus bursae ovoid, with two fields of small tooth-like, weak sclerotized signa. Figures on the morphology of the adult, male and female genitalia were provided by Buszko & Sliwinski (1978), Razowski (1981), and Povolny & Kralicek (1985).

Diagnosis. – The male of this species is superficially similar to *B. appendiculatus* (Esper, 1783). However, it can be distinguished easily by the shape of the antennal segments (compare Figs. 11, 12, and 14), the presence of a whitish costal spot on the forewing (absent in *B. appendiculata*), and by the shape of the white hindwing pattern (broad and continuous in *B. appendiculata*). Males of *B. mesopotamica* (Amsel, 1949) can be separated most easily by the shape of the antenna (filiform, smooth, without distinct processes). The female of *B. pumila* is unique by the shape of the white pattern on the forewing and the presence of white markings on the hindwing. Females of the *B. appendiculatus* species-group are black throughout; females of *B. funebris* (Feisthamel, 1833), *B. beryti* (Stainton, 1867), *B. flavescens* (Turati, 1919) and some related species have a similar forewing pattern but lack the white markings of the hindwing.

Distribution. – *B. pumila* is an expansive ponto-mediterranean species occurring in a wide range from eastern Central Europe to Central Asia. Confirmed records are from Lower Austria, Slovakia, Hungary, Romania, Bulgaria, Italy, Dalmatia, Croatia, Mac-

edonia, Greece, South Russia, Turkey, Syria, Kazakhstan, Kirgizstan, and North West China.

In the collection of the NRMS there are some females with printed labels "Andalusia". It is conceivable that some isolated populations of *B. pumila* may exist on the Iberian Peninsula, but until additional material becomes known these specimens are treated here as mislabelled. *B. pumila* is also mentioned for the fauna of France (Herrich-Schäffer 1854; Walker 1856; Heppner 1996). Although *B. pumila* does occur in the Valle d'Aosta (NW Italy) near the french border, no material or confirmed record has been found for France. Possibly previous authors have misidentified *B. funebris* (Feisthamel 1833), which has a similar female. Records of *B. pumila* from Germany (Heppner 1996) were repudiated recently (Kallies 1999).

Habitat and Bionomics. – The moths are active by day and have been found from June to mid August. Nothing is known about the early stages. Specimens have been collected in lowland steppe in central and eastern Europe, but also in xero-montane grasslands at altitudes of up to 2100 m in the southern part of the distribution range.

### *Brachodes candefactus* (Lederer, 1858)

(Figs. 3–6, 15, 16)

*Atychia candefacta* Lederer, 1858: 151. Type locality: Damascus [Syria]. Holotype ♀, in MNHB.

*Atychia diacona* Lederer, 1858: 151. **syn. n.** Type locality: Damascus [Syria]. Holotype ♂, presumably lost.

References. – Caradja 1920: 163 (*Atychia*); Heppner 1981: 13 (*Brachodes*)

Material examined. – Holotype ♀ (Fig. 5) "Syr[ia]." "Orig." "Holotype / *Atychia candefacta* / Lederer, 1859 / Axel Kallies rev. 1998" (MNHB); ♂ "Syr[ia]." "Orig." (MNHB); ♂, "Syr[ia]." (MNHB); Lebanon: ♂, Bscharre [Bsharri], 1850 m, 1.–15. VI. 31, leg. Pfeiffer (ZSM); 3 ♂, Cedern b. Becharre, 1900 m, 24.–30. VI. 1931, leg. Zerny (NHMW); Syria: 4 ♂, Anti-Lebanon Mts., Bludan, 33°45'N, 36°0'E, 20. VI. 1997, leg. Spatenka (CKS); ♂, ♀, Jabel Chmiss W Sarghaya, 33°48'N, 36°08'E, 18. VI. 1997, leg. Spatenka (CKS); ♂, Libanon (ZSM); Turkey: 2 ♂, Central Taurus / *tristis* Stgr. [sic.!] (NHMW); 3 ♂, Hadjin [Prov. Adana, Saimbeyli, 38°07'N, 36°08'E], (MNHB, NHMW); ♂, Pont[us]. / *compar* [sic.!] (ZSM); ♂, same data (MNHP); ♂, ♀, Marasch, Cil. Taurus [Prov. Maraş, Kahramanmaraş], VI. 1907 (MGAB); ♂, ♀, Zeitun [Prov. Maraş, Süleymanlı] (NHMW); ♂, Taurus (MGAB); ♂, Eibes [Prov. Hatay, Amanos Daglari, Akbes W of Hassa, 36°53'N, 36°28'E] (ex coll. Staudinger) (MNHB); 2 ♂, 60 km E Develi, Gezbeli Geçidi 1850 m, 22. VII. 1996, leg. Lingenhöle (CAK) (Fig. 4); ♂, Prov. Van, Güzeldere Geçidi, S. side 2500–2600 m, 4.–10. VIII. 1988, leg. v. Oorschot, de Prins & Riemis (CWP) (Fig. 3); ♂, Prov. Muş, 10 km SW Erentepe, 1800–1900 m, 28. VII. 1988, leg. v. Oorschot, de Prins & Riemis (CWP); 2 ♂, Prov. Bitlis, Nemrut Dağı, 2100–2400 m, 30. VII.–1. VIII. 1988, leg. v. Oorschot, de Prins & Riemis (CWP, ZSM); 2 ♂, Prov. Bitlis, 20 km E Tatvan, 1750 m, 4. VII. 1990, leg. v. d. Brink, v. d. Poorten & de Prins (CWP, CAK); 12 ♂, 12 km W Sakaltutan Geçidi, 1900 m, 39°53'N, 39°01'E, 18. VII. 1996, leg. Spatenka (CKS, CAK); 2 ♂, Prov. Sivas, 25 km E Zara, 1600 m, 23. VII. 1995, leg. Kallies (prep. AK132, CAK); 2 ♂, Erzurum, Kopdağı Geçidi, 2370 m, 40°01'N, 40°31'E, 10. VII. 1996, leg. Špatenka (CKS); Iran: 2 ♂, Zanzan-Gilvan, 1. Pass ca 1 km N Garavol Dag, 2400–2500 m, 3.–4. VII. 1999, leg. Hofmann & Meineke (CAK).

Description. – Male (Figs. 3, 4). Alar expanse 14–20 mm, usually 15–18 mm; forewing length 6–9 mm; body length 7–9 mm. Head with antenna black, scape yellow ventrally, segments prismatic, each with a short tooth-like process (Figs. 15, 16); frons shining black, with individual white or yellow scales; vertex black, mixed with yellow; patagia



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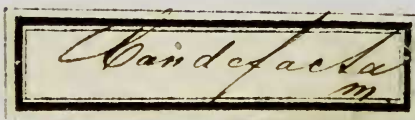
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and tegulae black, densely mixed with yellow to ochre scales; labial palpus straight, black, yellow interiorly and exteriorly; proboscis absent. Thorax black, with single yellow scales, tegulae covered with a mixture of yellow and black scales, with individual hair-like scales apically; metathorax with long whitish hair-like scales submedially. Forewing ground color black, densely covered with light yellow to ochreous yellow scales; fringe whitish to fuscous; ventral side black; from base to about 1/2 a narrow yellow medial streak; along anal margin light yellowish; along costal margin towards apex some yellow scales. Hindwing brownish black; towards base a yellow medial spot reaching almost to anal margin; fringe white to brownish; with similar markings ventrally, yellow medial spot usually extended to anal margin. Abdomen black; tergites and anal tuft with narrow white to yellow posterior margins; sternites more or less densely covered with light yellow scales.

Male genitalia (prep. AK132). – Uncus without pointed tips; aedaeagus narrow, almost straight, with numerous weak cornuti.

Female (Fig. 5). – Alar expanse 14 mm; forewing length 6 mm, body length 10 mm. Head, thorax and abdomen black; antenna filiform. Forewing orange-yellow; with black scales near base; a black transverse fascia at about 2/3; exterior margin black; fringe black; ventral side with an ill-defined yellow patch at about 2/3; yellowish along cubitus. Hindwing black; with few yellow scales near base; ventrally with an ill-defined yellow patch at about 2/3 of costal margin.

Diagnosis. – The species is similar and closely related to *Brachodes buxeus* sp. n. described below (q. v.). In male, *B. candefactus* is sometimes similar to *B. mesopotamica* (Amsel, 1949), but the latter can be distinguished by the filiform, smooth shape of the antenna (without distinct processes).

Variability. – Specimens from Turkey, especially from the northern part, tend to a more ochre-brown coloration of the forewing and reduced yellowish to white markings of the hindwing. Specimens from Syria, Lebanon and East Anatolia have usually a light yellow forewing and well developed white markings of the hindwing. Additionally, the color of the fringe varies from white to fuscous.

Distribution. – Known from Syria, Lebanon, Turkey (Central and East Anatolia) and NW Iran (new record).

Habitat and Bionomics. – Adults were collected by day in grass steppe mainly in mountain areas at altitudes from 1600 to 2400 m. The flight period starts at the beginning of June and lasts till the end of July. The host plant is a *Secale* sp., Graminae (Špatenka, personal observation). Two specimens (Turkey, Prov. Sivas, Zara) were observed to be non-specifically attracted to artificial pheromones made for Sesiidae.

Remark. – In his original description Lederer (1858) mentioned the lack of the abdomen of the type specimen of *Atychia diacona* Lederer, 1858. However, the male specimen

**Figs. 3–10.** *Brachodes* species. **3** – *B. candefactus* (Lederer, 1858), ♂, Turkey, Güzeldere Geçidi (CAK). **4** – dito, ♂, Turkey, 60 km E Develi (CAK). **5** – dito, ♀, holotype (MNHB). **6** – dito, labels of holotype. **7** – *B. buxeus* sp. n., ♂, paratype, Turkey, 10 km N Akseki (CAK). **8** – dito, ♂, holotype, Turkey, Akbez (BMNH). **9** – dito, ♀, paratype, Turkey, Akbez (MNHB). **10** – *B. anatolicus* sp. n., ♂, holotype, Turkey, Zara (CAK).

from Lederer's collection, labelled as "Orig[inal]", bears a complete abdomen which obviously has not been attached later. Consequently this specimen cannot, unfortunately, be the holotype of *Atychia diacona* Lederer, 1858.

***Brachodes buxeus* sp. n.**

(Figs. 7–9, 17, 19)

Material examined. – Holotype ♂ (Fig. 8) "Asia minor. / Amanus Mts. / Eybiz [Turkey, Prov. Hatay, Amanos Dağları, Akbes W of Hassa, 36°53'N, 36°28'E], 1903–357." "*Atychia* ? / n. sp. Washbn." (BMNH); Paratypes: ♂, same data as holotype (BMNH); ♂ "Alma Dagħ (Amanus Mts) / Asia Minor, -06" "Meyrick Coll. / B.M. 1938-290." "genitalia examined / by A. Kallies / prep. No. AK8" "B.M. Genitalia slide / No 29196" (BMNH); 2♂ "Eibes [Akbes]" "ex coll. Staudinger" (MNHB); ♂ "Eibes" "106." "Stgr. 14" (NHMW); ♀ (Fig. 9) "Eibes" "sp.?" "*Atychia candefacta* / ab. *fulminans* Rebel" (MNHB); ♂ "Hadjin [Turkey, Prov. Adana, Saimbeyli, 38°07'N, 36°08'E]" "*tristis* Stgr. [sic.!] / Hadjin" "107." "Stgr. 14" (NHMW); ♂ (Fig. 7) "Süd Türkei / 10 km nördl. Akseki / Irmasan Geçidi, 1100 m / 8. VII. 1996 / leg. Lingenhöle" "genitalia examined / by A. Kallies / prep. No. AK133" (CAK); ♂ "Türkei / Beysehir See (süd), 1150 m / 20 km W Beysehir / 9. VII. 1996 / leg. A. Lingenhöle" (CAK); ♂ "Türkei, Prov. Konya / Bakaran Umg., 1250 m NN / 23. VI. 1996 / leg. B. Schmitz" (CAK).

Description. – Male (Figs. 7, 8). Alar expanse 21.5–27 mm, typically 22–23 mm; forewing length 10.0–12.5 mm; body length 5.5–6.0 mm. In maculation of wings and body the male of the new species is very similar to the male of *B. candefactus* (cf. description given above). However, it can be distinguished by the wider alar expanse, by the presence of a developed proboscis, which is about as long as the fore coxa (absent in *B. candefactus*), by the longer tooth-like processes of the antennal segments (Fig. 17), and by the smaller beige-yellow marking on the hindwing underside (typically not reaching the anal margin).

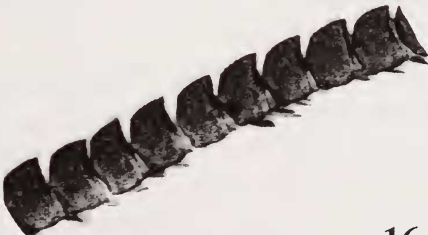
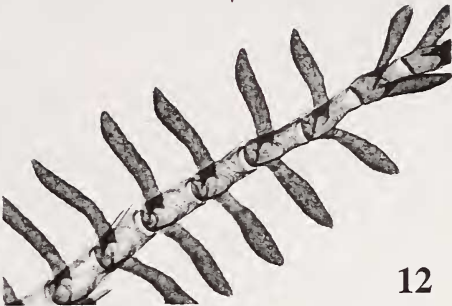
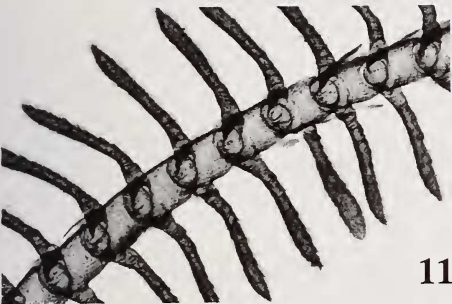
Male genitalia (prep. AK8, Fig. 19). – Uncus with well developed pointed apical tips (without in *B. candefactus*); aedaeagus narrow and long, curved basally (almost straight in the species compared); valva relatively narrow.

Female (Fig. 9). – Alar expanse 23 mm; forewing length 10.5 mm; body length 18.5 mm. By the orange and black markings of the forewing the female of *B. buxeus* sp. n. is similar to that of *B. candefactus* but can be separated easily by the size, the yellow, black bordered hindwing (black almost throughout in *B. candefactus*) and by the black transverse fascia and the exterior margin of the forewing (narrower in *B. candefactus*).

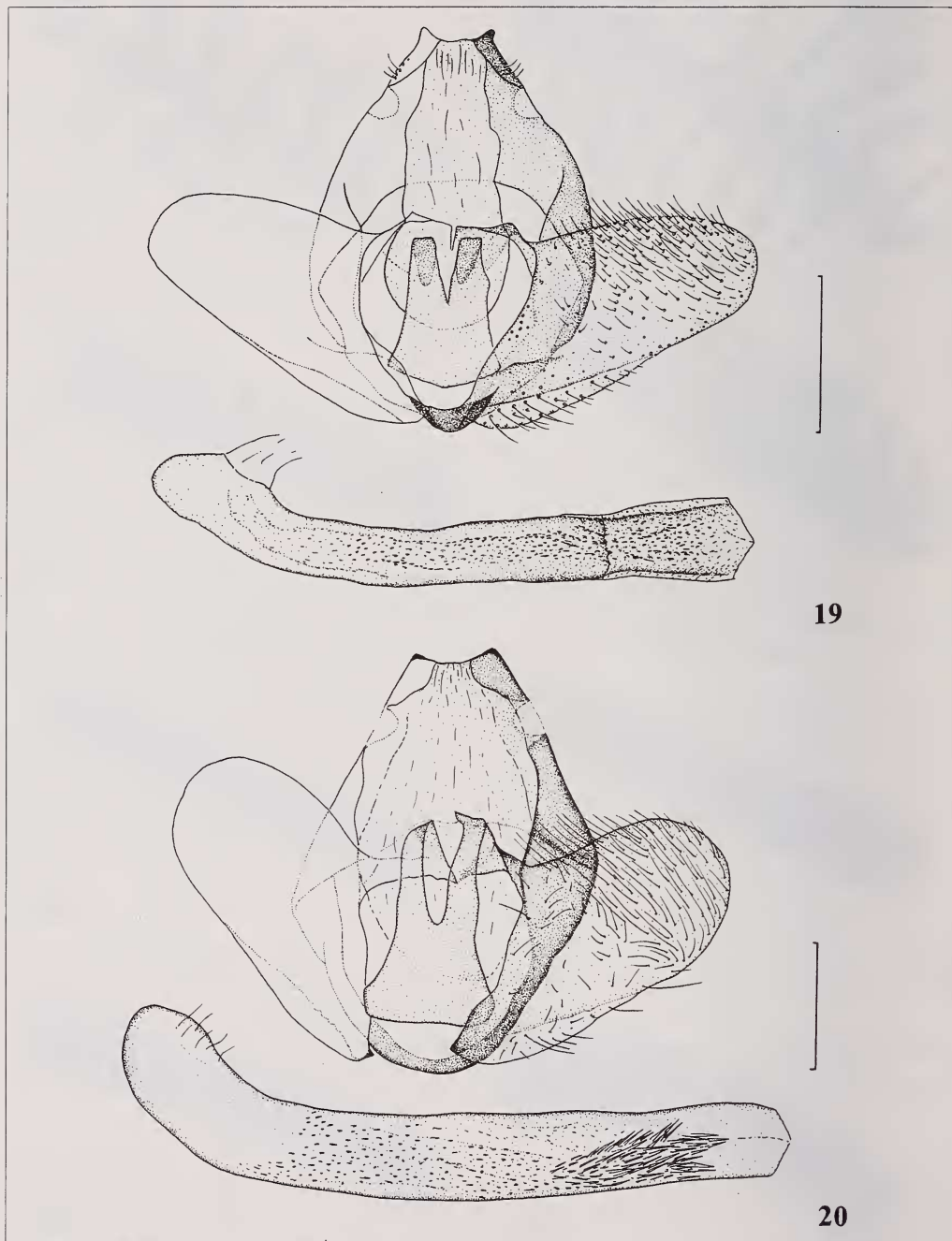
Diagnosis. – Both, *B. candefactus* and *B. buxeus* are similar to *Brachodes compar* (Staudinger, 1879) **stat. rev.**, and *Brachodes tristis* (Staudinger, 1879) superficially. However, these species belong to the *B. appendiculatus* species-group and can easily be separated by the bipectinate antennae (with two spoon-like processes on each antennal segment, Figs. 11–13) in the male, and by the completely black females.

Variability. – Males from the central Toros Mts (Akseki, Beysehir and Konya) show minor differences from specimens from the Amanus and eastern Toros Mts: the forewings

**Figs. 11–18.** Antenna of male *Brachodes* species. **11** – *B. appendiculatus* (Esper, 1783), middle portion, Russia, Seratov (prep. AK82-96, CAK). **12** – dito, apical portion, Italy, Aosta (prep. AK85-96, CAK). **13** – *B. cf. appendiculatus* (Esper, 1783), Turkey, Toros Mts (prep. AK91-96, CAK). **14** – *B. pumila* (Ochsenheimer, 1808), Greece, Ionannina (prep. AK90-96, CAK). **15** – *B. candefactus* (Lederer, 1858), Turkey, Zara (prep. AK127-96, CAK). **16** – dito, Lebanon, Becharre (prep. AK144-96, NHMW). **17** – *B. buxeus* sp. n., paratype, Turkey, Akbez (prep. AK130-96, MNHB). **18** – *B. anatolicus* sp. n., holotype, Turkey, Zara (prep. AK83-96, CAK).



are more brightly orange colored and the white pattern of the hindwings is better developed, on the ventral side extending to the anal margin. This range of variability is equally well seen in males of *B. candefactus*.



**Figs. 19–20.** Genitalia of *Brachodes* species. **19** – *B. buxeus* sp. n., ♂, paratype, Turkey, Akbez (prep. AK8/BMNH 29196). **20** – *B. anatolicus* sp. n., ♂, holotype, Turkey, Zara (prep. AK52, CAK).

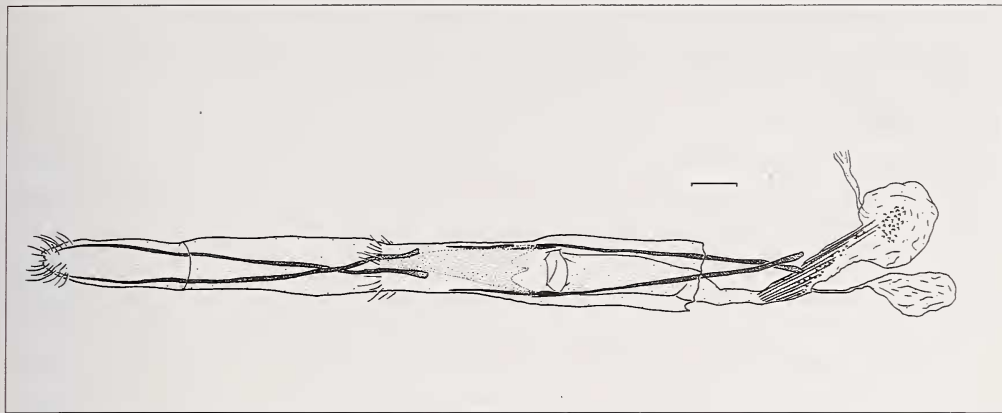


Fig. 21. – *Brachodes pumila* (Ochsenheimer, 1808), ♀, without data (prep. AK140, MNHP).

**Habitat and Bionomics.** – Unknown for the type locality. Three males from the central Toros Mts. were collected at altitudes between 1100 and 1250 m at the end of June and beginning of July.

**Distribution.** – Known only from the Amanus Mts (Akbes), the eastern and central Toros Mts in south-eastern and southern Turkey.

***Brachodes anatolicus* sp. n.**

(Figs. 10, 18, 20)

**Material examined.** – Holotype ♂ (Fig. 10) “Turkey. Prov. Sivas / 25 km E Zara, 1600 m / 23. VII. 1995 / leg. A. Kallies” “genitalia examined / by A. Kallies / prep. No. AK52” (CAK, will be deposited in MNHB later); Paratype: ♂, same data as holotype.

**Description.** – Male (Fig. 10). Alar expanse 18–19.5 mm; forewing length 8.5–9 mm, body length 8.5 mm. Head with black antenna, scape white, segments (Fig. 18) with long simple processes; labial palpus straight, rough, black and white scaled, apical segment smooth and black, basal and middle segments with long tufted scales ventrally; proboscis present but very short; frons shining black, with some white scales at upper margin; vertex and pericephalic hairs black, mixed with white scales. Thorax with black ground color, with narrow yellow-white scales; patagia black; tegulae black, covered with yellow-white hair-like scales. Forewing yellowish grey, in middle somewhat lighter, but without clearly defined white streak along fold and without costal spot; fringe yellowish grey; ventral side blackish grey, in middle part light grey; fringe white. Hindwing blackish grey; white subbasal band well developed, not reaching anal margin; fringe white; ventral side with similar markings. Abdominal tergites and sternites blackish grey, each with a narrow white posterior margin.

**Male genitalia** (prep. AK52, Fig. 20). – Uncus with short blunt apical tips; aedeagus long and strong, with a bunch of relatively strong cornuti; valva short.

**Diagnosis.** – This new species is somewhat similar to *B. pumila* and *B. candefactus*. In male, it can be distinguished by the shape of the processes of the antennal segments (apically bilobed in *B. pumila*, shorter in *B. candefactus*), by the short proboscis (long in

*B. pumila*, absent in *B. candefactus*), by the markings of the forewing (with a well defined narrow streak along fold and costal spot in *B. pumila*, without defined maculation in *B. candefactus*), and by the markings of the hindwing (the white band on the ventral side reaches the anal margin in *B. pumila* and *B. candefactus*). *B. anatolicus* is superficially also similar to species of the *Brachodes appendiculatus* group, such as *B. dispar* (Herrich-Schäffer, 1854), *B. keredjella* (Amsel, 1953), and *B. formosa* (Amsel, 1953), but it can be separated easily by the group characteristics given above.

**Habitat and Bionomics.** – The type specimens were observed to be weakly and unspecifically attracted to artificial pheromones made for Sesiidae in the late morning hours. They were collected in a hilly limestone area (karst) which is interrupted by ground depressions of brownish loess-like soil. This area is used for agriculture only in part. A highly diverse vegetation and a rich lepidoptera fauna has been observed in this area, including the Sesioidea: *Brachodes candefactus*, *Tinthia brosisiformis* (Hübner, [1813]), *Tinthia hoplisiformis* (Mann, 1863), *Bembecia cf. puella* Lastuvka, 1989, *B. stitiziformis* (Herrich-Schäffer, 1851), *Chamaesphecia proximata* (Staudinger, 1891), *Ch. colpiformis* (Staudinger, 1856), and *Bembecia scopigera* (Scopoli, 1763).

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